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REPORT AND RECOMMENDATIONS

OF THE

GOVERNOR'S TASK FORCE ON FLOOD PLAIN MANAGEMENT

JULY 1994

INTRODUCTION

Governor Carnahan issued Executive Order 93-40 on October 22, 1993, establishing a Task Force on Flood Plain Management. The Task Force brought together in a single forum many of those who advised the Governor throughout the flood disaster. He charged the Task Force with evaluating the current status of flood plain management in Missouri, and recommending ways to decrease the risk to life and property due to flooding. He asked the Task Force to specifically consider: (1) the building, rebuilding or relocation of levees; (2) State highway and road projects in flood plains; (3) expenditures of public funds for projects in flood plains which require state action or approval; and, (4) long term policy regarding development of housing and other private and public structures in flood plain areas.

Membership on the Task Force included two members from the Missouri House of Representatives, two members from the Missouri Senate, the Directors of the Departments of Agriculture, Natural Resources, Conservation, Highways and Transportation, Economic Development, Office of Administration, and State Emergency Management Agency. Also included were the executive director of the Missouri Housing Development Commission, the State Treasurer, and representatives from the Missouri Municipal League, Missouri Association of Counties, Missouri Farm Bureau, Conservation Federation of Missouri, and the Governor's Office.

Under the chairmanship of the Director of the State Emergency Management Agency, the Task Force on Flood Plain Management held an organizational meeting on November 9, 1993. At this session, the Chairman designated four working committees to examine the issues of flood plain management in depth. These committees--Relocation, Flood Plain Usage, Levee, and Legislation--met extensively November through May, and reported back to the full Task Force at monthly meetings. Although each Committee had 4-5 core members that were expected to participate, all Task Force Members were encouraged to attend and participate in all committee sessions. Experts and the general public also attended.

The Task Force was unanimous in the belief that continuing current flood plain management policies without modification was

unacceptable. The cost to Missouri citizens in terms of lives, property damage, and psychological trauma was too great to repeat past mistakes. At the same time, the Task Force was cautious to avoid the temptation of using an unusual event like the flood of '93 as an excuse to promote certain philosophical attitudes or policies which had not garnered public support in the past. Instead, the Task Force sought to find a balance between different flood plain uses, and obtain a satisfactory mix of economic, social, and environmental needs.

The following report and recommendations are the effort of a great deal of discussion and give and take. The Task Force sincerely feels that the implementation of these recommendations through legislation or executive order will benefit all the citizens of Missouri, by improving quality of life and reducing the potential for the occurrence of another disaster of the magnitude of the Flood of '93.

EXECUTIVE SUMMARY

BACKGROUND

FLOOD PLAINS

Flooding is a natural phenomenon. Periodically, rain and/or melting snow cause rivers and streams to rise and overflow their banks onto normally dry adjacent areas called flood plains.

FLOOD PLAIN DEVELOPMENT

Since flooding is a temporary condition, and because there are definite economic advantages in living close to rivers and streams, homes, businesses, and even whole communities have been built in flood plain areas despite the continual threat of flooding.

FLOODING IN MISSOURI

The State of Missouri has experienced repeated flooding. The Great Flood of '93 is the most devastating flood in Missouri history.

FLOOD CONTROL MEASURES

The traditional method of flood control is by and large a structural strategy. Loss of natural habitat has caused many to question continuing this strategy. Many are suggesting either a nonstructural or balanced strategy of flood control, that would include a balance between structural and nonstructural measures. The National Flood Insurance Program has not worked as conceived, and has become extremely costly. The cost of disaster assistance after a flood has also become extremely high.

A NEW VISION OF FLOOD PLAIN MANAGEMENT IN MISSOURI

THE VISION

The new vision of flood plain management in Missouri is to use a balanced strategy of structural measures, nonstructural measures, and relocation from the flood plain. This strategy, over time, will allow evacuation of the most vulnerable areas, while restoring areas of the flood plain to a more natural state, and still protecting developed areas.

GOVERNOR'S TASK FORCE ON FLOOD PLAIN MANAGEMENT

Governor Carnahan established a Task Force on Flood Plain Management to review and consolidate immediate recovery and long term flood plain management recommendations. The Task Force recognized that the cost of past policies has become too expensive, and that the State needs to become more actively involved in flood plain management in order to protect its citizens.

TASK FORCE RECOMMENDATIONS

After considering multiple options, the Task Force recommends that the State consider the following for legislative initiatives:

To organize the State's flood plain management, the Governor and Legislature should:

Create a multijurisdictional entity to advise the Governor on structural (levees, dams) and nonstructural projects (National Flood Insurance, outdoor recreational areas) and institutional and legal strategies for flood plain management.

Empower and resource a designated State Agency to develop and implement an effective overall strategy for flood plain management, under the guidance of the multijurisdictional entity.

To demonstrate that State Agencies are leading by example in flood plain management, the Governor should issue an Executive Order (new E.O. would supersede E.O. 82-19) that requires State Agencies to:

--identify which State structures lie in floodways, 100 year, and 500 year flood areas.

--ensure that those structures are insured and meet the minimum standards of the NFIP.

--prepare emergency response and evacuation plans for those structures in flood plains.

--report to the Governor annually on compliance with these requirements.

--adopt the following state-wide standards that apply to all state-owned construction in flood prone areas: (1) when no damageable upstream or downstream buildings or structures are present, construction must meet existing NFIP minimum standards; (2) when damageable upstream or downstream buildings or structures are present, state construction may not

unreasonably cause increased flood damage potential to those buildings or structures.

--require that any future expenditure of State controlled funds for new flood plain projects be limited to: (1) projects consistent with open space use; (2) public works projects that comply with NFIP standards.

To assist those who wish to move from the flood plain, the State should:

--maximize use of federal funds in support of disaster mitigation, through the Community Development Block Grant program and Hazard Mitigation Grant Program to fund Missouri community buyout requests.

--maximize use of federal funds in support of acquiring easements on farmland through the Emergency Wetlands Reserve Program, Conservation Reserve Program, and any other federal programs.

--assist farmers in getting monetary assistance through the federal government's Emergency Conservation Practices Program, to aid in clean up of debris on damaged acreage.

--encourage the Missouri Department of Conservation to develop and implement a plan to purchase flood plain acreage from willing sellers.

To actively manage flood plain usage, the State should:

--**establish state-wide standards for new construction in the flood plain. Such standards should:**

--encourage open space use of the flood plain.

--prohibit construction of critical structures and facilities (hospitals, nursing homes, retirement homes, homes for the elderly or handicapped, emergency and rescue facilities, prisons, drinking water, electric power supply substations, sewage treatment) in the flood plain. (It is recognized there may be no alternative upland site for sewage treatment. If not, then sewage treatment structures must be elevated two feet above base flood elevation.)

--require transportation improvements that are new or are major reconstructions to comply with all NFIP standards for construction in flood plains, while designating critical highways (those which must remain open to ensure the Governor can move personnel and equipment across the Missouri River to assist in disasters) that need to be built to 500 year flood event standards.

--review policies for existing structures in the flood plain, and for those that cannot be reasonably moved, the State should:

--enact building standards that require flood-proofing consistent with NFIP standards.

--enact building standards for critical structures that require either elevation or flood-proofing two feet above the base flood elevation, or vacating basements and floors to a level two feet above base flood elevation.

--encourage maximum community participation in the NFIP, to allow all Missourians that live in flood plains the opportunity to purchase flood insurance.

--affirm that in future flood incidents the State accepts the principle that communities that participate in the NFIP will receive priority in block grants and disaster assistance funding.

--require that appraisers, lenders, insurance agents, and realtors determine and notify all persons involved with land and other real estate transactions the status of the property relative to the 100 year flood plain, and fine those who do not comply.

--require lenders to ensure that those who take a loan on flood plain property purchase and maintain flood insurance as a condition of the loan.

--create a statutory definition of the pre-flood market value of structures for the purpose of compliance with NFIP regulations.

--identify and rank in severity existing constrictions to flood conveyance, and propose remediation plans, where feasible.

To protect the public from hazardous materials in the flood plain, the State should:

--prohibit commercial propane and gas storage facilities from location in the flood plain.

--require all noncommercial propane and gas tanks in the flood plain be securely anchored to the ground, with the name and address of the owner permanently affixed.

--require construction and location of natural gas lines in the flood plain be performed in such a way as to prevent rupture due to flooding.

--require natural gas pipeline companies to provide information on easily accessible emergency shut-off valves to state and local emergency response agencies. (Amend RSMo 319.500 to include natural gas pipelines along with existing safety requirements for the transport of hazardous liquids in pipelines. The current state statute calls for an emergency response plan describing the operator's procedures, including accurate mapping of the location of pipeline facilities and communication and alert procedures for immediate notification of state and local officials at the time of any release.)

--prohibit new commercial manufacture or storage of pesticides in the flood plain, while requiring that current manufacturing and storage structures be flood-proofed or elevated to two feet above base flood elevation. (River terminal storage structures must be elevated or flood-proofed.)

--require that temporary individual pesticide storage facilities located in a flood-prone area must be evacuated when a flood event is forecast.

--require new or existing storage for individual use of pesticides be elevated or flood-proofed to two feet above base flood elevation.

--prohibit future placement of hazardous substances from location in flood prone areas.

--require current storage facilities for hazardous substances be elevated or flood-proofed to a level two feet above the base flood elevation.

To oversee levees, the State should:

--encourage that existing levees be repaired to no higher than pre-flood height.

--encourage that new non-federal levees constructed to protect principally farmland should not exceed the 25 year flood protection elevation.

--encourage that prior to constructing new non-federal levees that protect principally farmland, that set backs be considered.

--encourage that levee districts be consolidated, where possible.

--assist Missouri farmers by facilitating repair of levees.

--encourage legislation to establish a permit program for construction or modification of levees; and, inventory and describe all existing levees for the purpose of developing policy guidelines and design criteria. Any permit

issued by the State would be deemed to meet the requirements of reasonable use.

--enact legislation that makes it easier and quicker to form levee districts and gain public sponsors for levees so they can participate in the Corps of Engineers program.

--review the current levee system in Missouri to determine the impact on '93 flooding, and make recommendations for alternatives to the current levee system, to include relocation of levees, set backs, and construction standards.

--affirm that in future flood disasters the State accepts the principle that those who make commitments to the COE or SCS in order to receive disaster assistance to repair a levee, and then fail to live up to those commitments, should be denied future federal repair assistance.

To promote the fiscal health of the National Flood Insurance Program, the State should encourage the Federal Government to:

--establish substantial penalties for lenders that fail to notify prospective mortgagees of flood hazards, or fail to require flood insurance coverage through the life of the loan.

--require escrow for flood insurance, and authorize the regulated lending institution or federal agency to purchase the insurance on behalf of the borrower.

--clarify and strengthen the clause which requires federal financial regulatory agencies to direct lenders, subject to their regulatory jurisdiction (secondary loan industry), to require borrowers, whose securities consist of buildings or mobile homes located in flood-prone areas, to purchase flood insurance.

--replace Section 202(b) of the 1973 Flood Disaster Protection Act (notification requirement) with the requirement that federal instrumentalities issue regulations prohibiting lenders from making conventional loans with respect to property in nonparticipating communities.

--shift NFIP emphasis from insurance and emergency disaster assistance to prevention through mitigation.

--ensure the Federal Emergency Management Agency improves their oversight and enforcement under the authorizing laws of the National Flood Insurance Program.

--recalculate the base flood elevation and make that information available to the states and local governments.

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REPORT

FLOOD PLAINS

Flooding is a natural phenomenon, and consists of partial or complete inundation of normally dry land areas. Floods are caused by the overflow of rivers and streams, and/or the unusual and rapid accumulation or runoff of surface waters from any source. Although flooding is natural and repetitive, it is also a temporary condition. Periodically, rain and/or melting snow cause rivers and streams to rise and overflow their banks onto the adjacent areas that are normally dry. Various types of flooding exist--flash flooding, long term inundation, backwater flooding, interior drainage are examples.

The areas adjacent to rivers and stream banks that serve to carry excess floodwaters during rapid runoff are called flood plains. A flood plain is defined as the lowland and relatively flat areas adjoining rivers and streams. The term base flood, or 100 year flood is the area in the flood plain that is subject to a one percent or greater chance of flooding in any given year, based upon historical records. Flood plains are a vital part of a larger entity called a basin--defined as all the land drained by a river and its branches.

The land that forms the State of Missouri is contained within either the Mississippi, Missouri, Arkansas, or White River Basins. (figure 1) The Mississippi River Basin drains the eastern part of the State; the Missouri River Basin drains most of the northern and central part of the State; the White River Basin drains the south central part of the State; while, the Arkansas River Basin drains the southwest part of the State. The Missouri River Basin drains over half the State as the River moves west to east across the State. When the Missouri River joins the Mississippi at St. Louis, it becomes part of the Mississippi River Basin--the largest basin in terms of volume of water drained on the North American continent. (figure 2)

The fact that most of the land that comprises the State of Missouri is part of the Mississippi-Missouri River drainage basin means that a significant portion of the land area of the State lies in flood plains. St. Charles County, for example, has 43% of the land that comprises the County in flood plains. In terms of agricultural land in Missouri, 34% of Missouri's cropland lies in a flood plain.

FLOOD PLAIN DEVELOPMENT

Historically, the land that comprises the State of Missouri was settled by European immigrants along the two great rivers-Mississippi and Missouri. People

Figure 1.

MISSOURI IN THE MISSISSIPPI RIVER SYSTEM

As shown in figure 1, Missouri occupies a central location in the Mississippi River drainage system. According to national terminology, that portion of the state drained by the Mississippi above the Ohio River is considered to be in the Upper Mississippi River Basin. This includes that part of the state between the Des Moines River and the Ohio River. Along Missouri's border, two major tributaries, the Ohio River and the Illinois River, enter the Mississippi from the east.

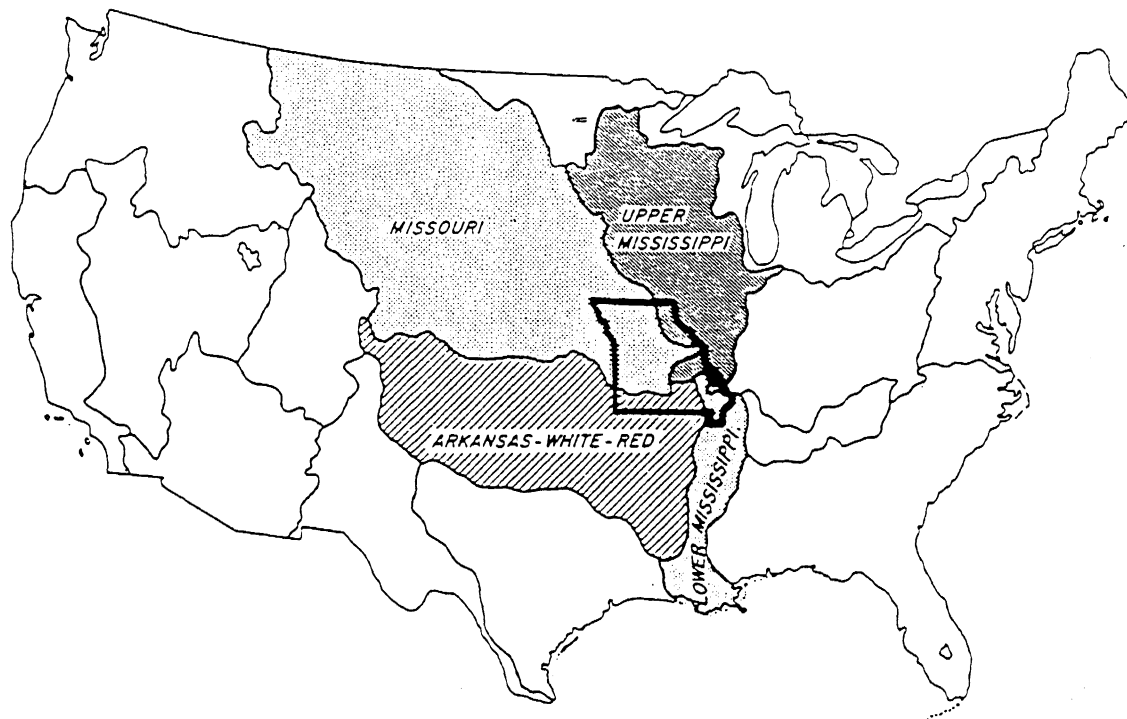
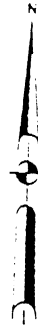
That portion of the state which is drained directly by the Mississippi River and lies below the Ohio River junction is considered to be in the Lower Mississippi River Basin.

The southwestern and south-central portions of Missouri are part of the Arkansas-White-Red River Basin. Missouri streams in this area contribute to the White and Arkansas Rivers, both of which drain into the Mississippi River.

The Missouri River flows through the center of the state from west to east and enters the Mississippi River above St. Louis. The Missouri River Basin is the largest of the major river basins in Missouri.

This central location of Missouri in the nation's drainage system has greatly influenced the settlement and economic development of the state. These rivers continue to be important as water resources and in providing connections with other parts of the United States and with the world.

For further information, contact the Missouri Department of Natural Resources, Jefferson City.



Major River Basins





-  Missouri River Basin
-  Upper Mississippi River Basin
-  Lower Mississippi River Basin
-  Arkansas-White-Red River Basin

Figure 2.

AREA OF DRAINAGE BASINS

A drainage basin, or watershed, consists of the land areas drained by a river and its tributaries. All Missouri is drained either directly or indirectly by the Mississippi, Arkansas White or Missouri Rivers. These divide the drainage of the state into four major basins: the Missouri River Basin, the Upper Mississippi River Basin, the Lower Mississippi River Basin, and the Arkansas White River Basin. These major basins can be subdivided into smaller basins and sub basins, depending on the size or order of the tributary.

This figure shows the approximate area in square miles of 38 drainage basins in Missouri. Figures refer only to the Missouri portion of those drainage basins extending beyond Missouri. For example the area of the Osage River Basin in Missouri is 10,700 square miles, but the total area of the basin, which includes a portion of Kansas, is over 14,500 square miles.

Drainage basin area data are important to many agencies in their water planning activities. For example, knowing basin area figure precipitation figures and other pertinent data, one can calculate the volume of surface water for an area. Information on volume of surface water is essential for such purposes as designing reservoirs, flood control projects and soil conservation practices.

Further information on drainage basin area is available for the Water Resources Division of the US Geological Survey, Rolla.



settled near rivers and within flood plains because of the proximity to drinking water and natural resources, the fertility of the soil, and the advantage of water transportation for commerce. Settlement along rivers was followed by settlement throughout the basins, which led to clearing of upland cover, modification of landscape, and increased water runoff. Increased human settlement has over time resulted in loss of wildlife habitat and diminishing ecosystem diversity.

Those who chose to permanently settle along Missouri rivers did so with the knowledge that rivers flood from time to time. Indeed, in sparsely populated areas, flood waters at the right time in the growing cycle were thought to have positive effects, providing a flushing action to cleanse agricultural lands and add a fresh layer of rich soil in the alluvial bottom. These positive effects were balanced against the negative effect of flood waters on agricultural land of scouring, sand deposits, and destruction of crops. The effects of flood waters on populated areas can be even more devastating, with massive property destruction and a high probability of deaths.

Over time, as communities became established in Missouri flood plains, people tried to protect themselves from flood waters. They built earthen berms and levees, and sought other means to divert flood waters away from populated areas and farmland. As technology advanced, communities demanded that government provide the resources to protect them from flood waters, assist in draining land for agricultural production, and maintain river channels for transportation.

FLOODING IN MISSOURI

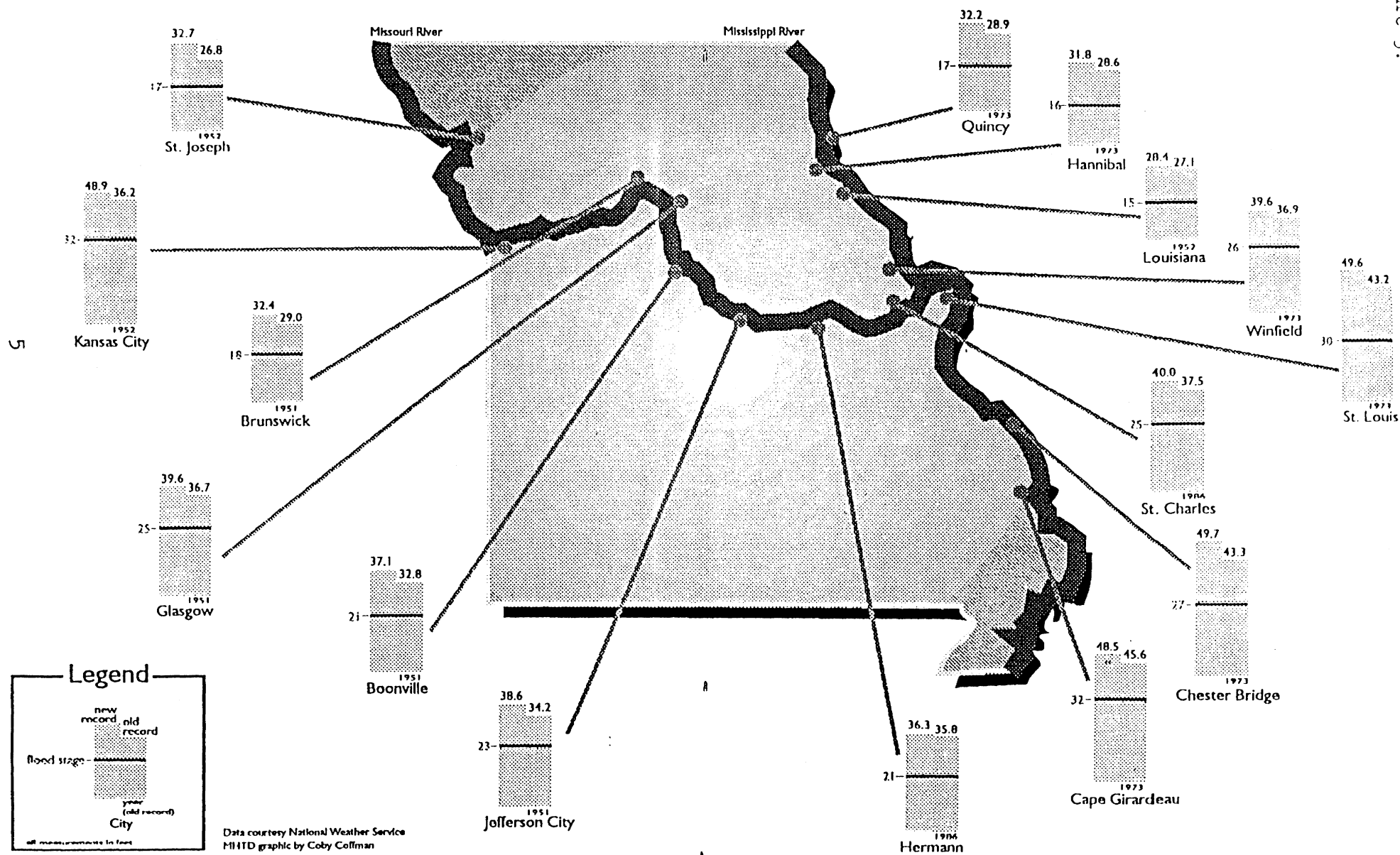
The State of Missouri has experienced repeated flooding throughout this century. Floods in '51, '73, '79, '82, '84, '86 have exacted a heavy price in death and destruction. However, none of these floods compare with the record flood in 1993 for duration and devastation.

THE GREAT FLOOD OF '93

In 1993, the State of Missouri experienced the greatest recorded flood disaster in the history of the state. Abnormal rains throughout spring, summer, and fall led to severe and prolonged flooding throughout the State. (figure 3) Flooding began in the spring, leading to 8 counties receiving federal disaster declarations. By mid-summer, prolonged floods resulted in 102 Missouri counties, and 3 cities being declared disaster areas for individual assistance, and 88 Missouri counties, and 3 cities declared disaster areas for public assistance. Then in the fall, 24 Missouri counties were declared eligible for disaster assistance due to flash flooding. This equates to all but two Missouri counties being declared a disaster area because of flooding during 1993.

The Flood of 1993 breaks all the records!

Figure 3.



Total losses during these flood disasters included 49 deaths, and damages totaling approximately \$3 billion. More than 37,000 Missourians applied for disaster assistance from FEMA/SEMA, and as of June 30, 1994, 15,672 checks totaling \$26.25 million had been distributed for individual and family grant assistance. Public Assistance to county and local governments totaled, as of June 30, 1994, \$82.1 million, as 2100 checks had been issued for debris removal, road and bridge repair, clean up and repair of water facilities, public buildings and utilities. In addition, agricultural losses totaled \$1.8 billion, as 3.1 million acres of farmland were either damaged or went unplanted because of '93 rains. Damage to public and private levees in the State was extensive, as 840 of the 1456 levees were damaged. Public roads and highways were also severely damaged as spending on repairs totaled some \$70 million.

As great as these monetary statistics are, the toll on individuals and families was staggering. Almost every Missourian was at some time affected by the floods through inundation of roadways, airports, drinking water and sewage treatment facilities, and by loss of income because of the effect of flood waters on economic activity. 54 shelters and 34 first aid stations were set up for flood survivors. 2.1 million meals were served, and voluntary agencies provided approximately \$65 million in donations of food, clothing, furniture, rent, and home repairs. Although the outpouring of disaster assistance help from neighbors was truly incredible, needs were great. It will take years before the psychological and economic damage from these floods can be overcome.

The enormous suffering and devastation caused by the '93 floods reminded Missourians once again the importance of preparing for natural disasters. It also caused many Missourians to question the effectiveness of past policies of flood control and flood plain development. For despite spending enormous sums on trying to keep rivers away from people and property, flooding continues.

FLOOD CONTROL MEASURES

In 1936, the Federal Flood Control Act was the first attempt by the federal government to develop a coordinated plan for installation of flood damage reduction measures. The U.S. Army Corps of Engineers was given responsibility for developing transportation and preventing flood damage on major rivers. The Corps carried out its mission primarily through structural measures, such as reservoirs, levees, channelization, and diversions. Within the State of Missouri, the Corps maintains 110 levees.

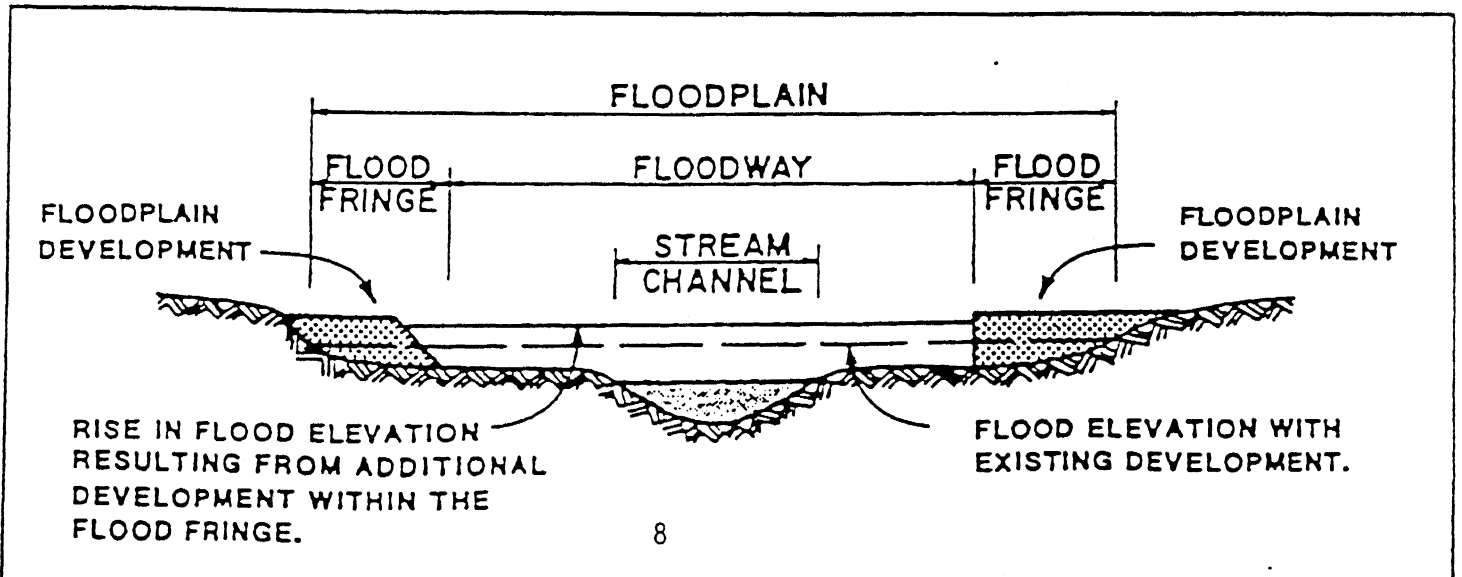
Besides levees however, there are many different kinds of structural measures, which serve as flood control or bank stabilization measures. **Cedar/willow revetment treatment** uses a layer of cedar trees placed over eroding soil on a stream bank, and willow sprouts planted among the cedars to stabilize the revetment. **Channelization** is cleaning out existing channels or creating a new

or partially new channel to assist in drainage and stabilize banks. **Dams** provide reservoirs of water and regulated release. **Dry dams** have a small opening in the bottom to temporarily collect flood water, then drain it slowly. **Constant level lake dams** maintain water at a certain elevation, largely for recreation, but can serve as temporary storage. **Multi-purpose lake dams** impound water to provide for recreational use and storage of water for release after the flooding condition is reduced. **Locks and Dams** are used primarily for navigation to impound water so that adequate depth is maintained for navigation. **Dikes** are large stones placed in the river and designed to maintain the channel. **Diversions** are movement of water from one basin to another. **Drainage** is removing excess surface water and excess soil moisture through land modifications. **Elevation** attempts to move structures above flood level. **Floodwalls** are similar to levees, and are usually concrete walls installed between the area to be protected and the water source. **Gabions** are wire baskets filled with rock, that are placed along a stream bank for stabilization. **Levees** are embankments built along the river to hold out water from normally dry areas. **Terraces** are continuous mounds of soil which follow the same elevation around a hill, so that rainfall is collected then drained through a drainage ditch. **Retrofitting** is changing an existing structure to become more flood proof.

During the Great Flood of '93, structural measures prevented a great deal of damage to Missouri's cities, infrastructure, and farmlands. The floodwalls at Kansas City, St. Louis, and Cape Girardeau held, even though the River at St. Louis was 20 feet above flood stage. The Corps of Engineers estimates that as a result of their in place flood control facilities during the flood of 1993, approximately \$19.1 billion in damages was prevented throughout the Upper Mississippi River Basin.

Besides structural strategies and approaches to flood control measures, there are also nonstructural strategies and nonstructural means of flood control. Maintaining land in **open space** is a term which designates land use that is free of structures and man made improvements. **Buyout** is a term used to describe government purchasing of land in the flood plain with improvements (houses, other structures) from willing sellers, for the purpose of removing the structures for open space use. **Relocation** is moving a structure from the flood plain to a new location, where there is no threat of flooding. **Building codes** for flood plain construction can cover location, design, safety, and other standards, thus regulating what can or cannot be built in a flood plain. **Zoning** can be used by governments to limit the type of activity or building within an area. The **National Flood Insurance Program** makes federally subsidized flood insurance available to communities that enact flood plain management regulations in concert with federal guidelines. Maintaining a **regulatory floodway** is a strategy of providing the watercourse adequate space to carry the greatest portion of the waterflow in a flood. (figure 4) **Floodway maintenance** keeps the central portion of the flood plain unobstructed so that it carries the greatest portion of the water flow in a flood. **Grass waterways** can be placed in low drainage areas for the purpose of

Floodplain and Floodway Schematic



reducing erosion into streams, thus assisting in maintaining an unobstructed waterway. **Wetlands** can serve to retard flooding until saturated, aid in recharging aquifers, improve water quality, and in general improve habitat areas.

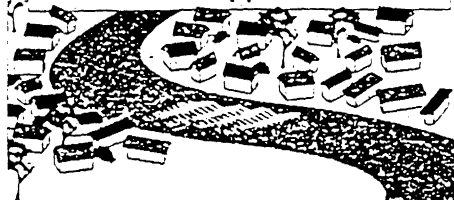
The major federal nonstructural program that seeks to mitigate flood damage is the National Flood Insurance Program, which was established by President Truman in response to the disastrous flood in Missouri in 1951. When Truman discovered that no private insurance company would offer flood insurance, he declared "then the government should offer it." The NFIP was established by the National Flood Insurance Act of 1968, which has two primary objectives: to make available federally subsidized flood insurance for existing development; and, to ensure that future development in flood hazard areas is done safely, with buildings elevated or floodproofed.

Within the State of Missouri, 518 communities with an identified flood hazard area participates in the NFIP, while 105 communities do not. Participation within the NFIP requires a community to adopt and enforce a flood damage reduction ordinance that meets minimum federal requirements, as a condition of receiving the opportunity for individuals to purchase flood insurance policies. Currently only 9% of the flood prone structures located within participating communities are insured. Maps are provided to the community in order that communities can identify the boundary of flood hazard areas. In general the community ordinance must require that new buildings and substantial improvements be undertaken above the base flood elevation. Insured losses in Missouri from 1978 to 1992 amounted to \$121 million. Insured losses from the Great Flood of '93 will exceed \$200 million in Missouri. Annual premiums in Missouri are around \$70 million.

Although both the major federal programs--Flood Control projects by the Corps of Engineers and the NFIP--have brought benefits to the State, both have also produced less desirable and/or unintended effects. Emphasis on structural measures of flood damage reduction has led to loss of wetlands and other natural habitat. Missouri has lost nearly 87% of its original 4.8 million acres of wetlands. (Dahl, 1990) Placing levees-federal or private along the Rivers--has also led to development in flood plain areas that may not have taken place had the levees not given a sense of protective security from floodwaters. Federally subsidized insurance has also led to areas being developed within flood plains that otherwise may not have been developed given actuary rates. (figure 5)

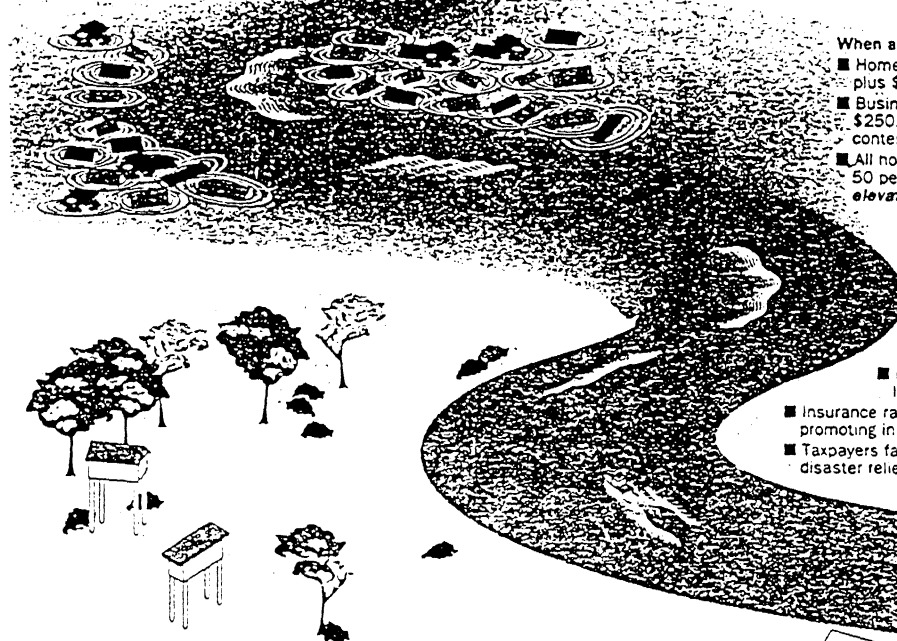
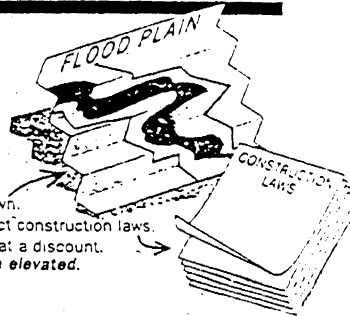
Although this loss of natural habitat to expanded human development has only recently surfaced for many Americans, it has become for many a high priority concern. As more and more land is developed for human use, less becomes available for wildlife habitat or wilderness. Increased human development in flood plain areas subject to a high probability of flooding, even with structural protection, has led many to question the wisdom of locating homes and businesses in these areas.

How It Was Supposed To Work



A flood-prone community needs insurance.
The only option: join the National Flood Insurance Program.

- Policies are sold to anyone, but flood-plain residents with a federally backed mortgage *must* buy.
- The government maps the town.
- Local government adopts strict construction laws.
- Low-lying homes get policies at a discount.
- *All new construction must be elevated.*



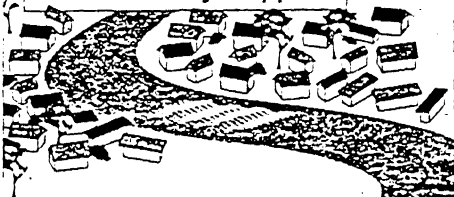
When a flood strikes:

- Homes are covered up to \$185,000 plus \$60,000 for contents.
- Businesses are covered up to \$250,000 plus \$300,000 for contents.
- All homes damaged by more than 50 percent of market value *must* be *elevated or torn down*.

- Gradually, flood-plain communities are elevated and thinned out.

- Future floods cause less damage.
- Insurance rates go down, promoting insurance sales.
- Taxpayers face lower disaster relief costs.

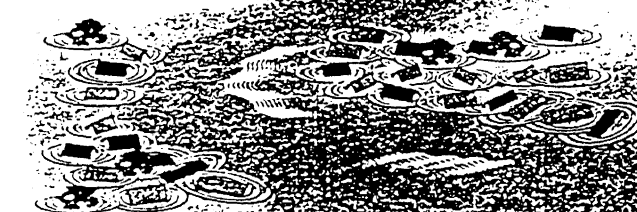
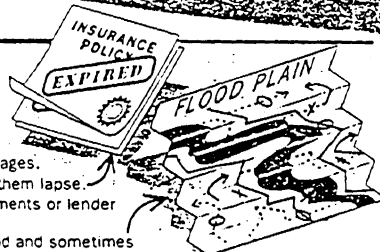
What Actually Happens



Fewer than one in 10 flood-plain families in the Midwest buys insurance.

Here's why:

- Some lenders ignore law requiring borrowers to get insurance with mortgages.
- Homeowners who do buy policies let them lapse.
- Government can't track premium payments or lender compliance.
- Flood-plain maps are hard to read and sometimes wrong, confusing lenders and potential buyers.
- Building inspectors are lax, leaving buildings in harm's way.

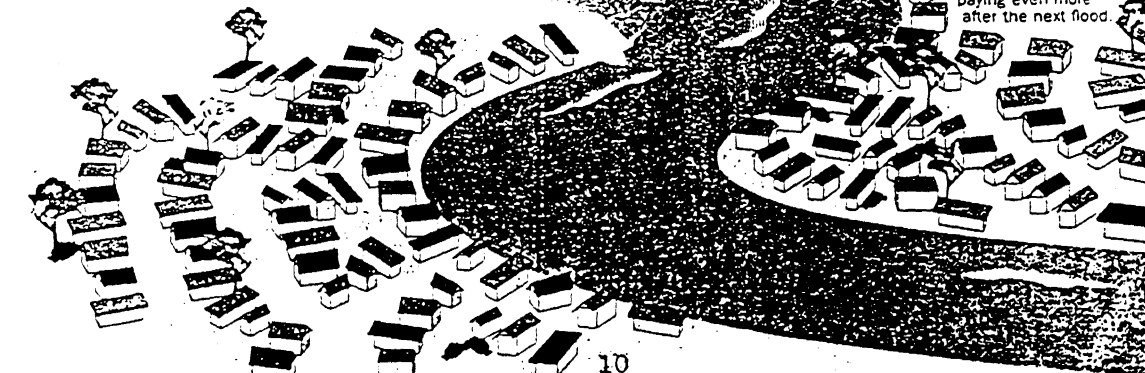


When a flood strikes:

- Inspectors allow homeowners to rebuild in the path of future floods.
- Rules allow unlimited repeat insurance claims.
- Repeat claims on previously flooded homes help keep premiums high.

The cycle continues:

- Flood plains remain cluttered with low-lying homes.
- Most homeowners keep rejecting insurance.
- Low enrollment leaves taxpayers picking up the cost of disaster relief, paying even more after the next flood.



Reprinted with permission St. Louis Post-Dispatch, November 21, 1993
Special Report Disaster Before the Disaster

Although the NFIP has been the main nonstructural strategy, another nonstructural strategy has surfaced as a result of this flood. This buyout and relocation program was originally adopted as a way to assist people left homeless by flooding, to receive compensation for their residence and move to an area away from the flood plain. It was soon recognized however, that the use of this strategy long term, could save substantial sums of money for taxpayers. As long as people inhabit flood plains, there will continue to be monetary costs to government from flooding, either through insurance costs or disaster assistance. Assisting willing sellers to move from the flood plain will save tax dollars in the long run.

RECOMMENDATIONS

A NEW VISION OF FLOOD PLAIN MANAGEMENT IN MISSOURI

The Great Flood of '93 may prove to be a watershed event. The cost of providing disaster assistance to those who live in flood plains has become high. Governments (Federal and State) have decided that in the long run, it is less expensive to purchase flood plain property from willing sellers than to continue repetitively paying insurance claims and/or providing disaster assistance.

TASK FORCE RECOMMENDATIONS

RECOMMENDATION 1: CREATE A MULTIJURISDICTIONAL BODY TO RECOMMEND FLOOD PLAIN MANAGEMENT POLICY; AND, EMPOWER AND RESOURCE A DESIGNATED STATE AGENCY TO IMPLEMENT FLOOD PLAIN MANAGEMENT POLICY

The Governor's Task Force on Flood Plain Management feels that the State needs a primary policy formulating body, similar to the current Task Force, which represents many different interests and points of view in order to have a full range of ideas on how to manage the flood plain. This body will make recommendations for legislation and other policy aspects of flood plain management. At the same time, the Task Force feels the ability to implement flood plain management decisions should be concentrated within one agency so that an overall and consistent policy can be presented.

Therefore, the Task Force recommends that the State create a multijurisdictional policy making body to advise the Governor and Legislature, while also empowering and resourcing a designated State Agency to implement the policy decisions made by the Legislature and Governor.

RECOMMENDATION 2: STATE GOVERNMENT MUST LEAD BY EXAMPLE

The Task Force felt that the best way for the State to discourage construction in the flood plain is to lead by example and, in general, avoid locating new State structures in the flood plain, while flood-proofing existing structures, and ceasing expenditure of state monies on flood plain projects that don't meet NFIP standards. The state should adopt standards that apply to all state-owned construction in flood prone areas that meet the following standards: (1) when no damageable upstream or downstream buildings or structures are present, construction must meet existing NFIP minimum standards; (2) when damageable upstream or downstream buildings or structures are present, State construction

may not unreasonably cause increased flood damage potential to those building or structures.

The Task Force also felt that the Governor should ensure that all State structures that lie in floodways, 100 year, and 500 year flood areas should be identified, insured to the minimum NFIP standards, and have an emergency response and evacuation plan.

The Task Force recognized that the State has not been pro-active concerning management of flood plain usage in the past, and that if the State chooses to be in the future, as the Task Force recommends, then the State must lead by example.

RECOMMENDATION 3: ASSIST PEOPLE TO MOVE FROM FLOOD PLAINS

The Task Force felt that the movement of willing sellers from the flood plain is the most significant action that can be taken to decrease the impact of future floods. Damage to life and property will decrease as people move out of flood hazard areas. This type of mitigating effort is expensive however, and will require increased and continuous federal funding to help willing sellers move.

The same can be said for giving farmers alternatives to not farming flood plain land. If flood plain land is willingly offered for conversion to natural resource benefit, then this also will decrease the impact of future floods. This type of mitigating effort is also expensive, and will require increased and continuous federal and State funding (the Missouri Department of Conservation is dedicating resources to a new program) to help willing farmers cease farming land in flood plain areas.

As a result of the Great Flood of '93, Governor Carnahan decided that the highest recovery priority go to assisting individuals return their lives to normal, or as normal as possible, given the circumstances. The Governor instructed the State Emergency Management Agency to use FEMA 404 Hazard Mitigation Grant Program funds, and the Department of Economic Development (DED) to use Community Development Block Grant (CDBG) funds to initiate a voluntary program of buyout of flood damaged homes. Communities were given funds to identify and purchase flood damaged property at a fair market price. The Community must agree to take title to the property and maintain the property for open space use in perpetuity. The homeowner gets a fair price for his property, and the taxpayer benefits in the long run since houses are removed from the flood plain, and no further disaster assistance will be forthcoming to that address. When the Missouri buyout program is completed 49 local projects will be funded through a combination of FEMA 404 Hazard Mitigation Grant Program funds and CDBG funds. This translates into 2,427 private residences, 1,178 mobile home pads, 4 apartment buildings, and 385 flood plain lots.

In addition, approximately 12,000 acres of Missouri farmland have negotiated easements worth \$8.4 million under the Emergency Wetlands Reserve Program. The Task Force encourages all farmers who are willing to use federal and state programs to take damaged or marginal land out of production.

RECOMMENDATION 4: ESTABLISH STATE STANDARDS FOR NEW AND EXISTING STRUCTURES IN FLOOD PLAINS

In addition to leading by example and funding willing sellers, active management of flood plain usage must occur in order to decrease the impact of future floods. Threats to public safety, loss of economic activity within the state and resulting costs to all levels of government as a result of the flood disaster of 1993, warrant a more active role for all levels of government, to include the State. Lack of past effective management of the Missouri flood plains has resulted in inappropriate usage. Too many people are living in Missouri flood plains. Too many inappropriate buildings have been constructed in the flood plains. Too many buildings constructed in flood plains lack the needed flood-proofing to withstand 100 year floods. Too few property owners in the 100 year flood plain participate in the National Flood Insurance Program. Too many hazardous materials are located in the flood plains.

The Task Force feels the State needs to take a more active role in flood plain management by establishing state-wide standards for new construction in the flood plain, which encourages open space use and prohibits construction of critical structures and facilities (hospitals, nursing homes, retirement homes, homes for the elderly or handicapped, emergency and rescue, prisons, drinking water, electric power supply substations, sewage treatment) in the flood plain. (It is recognized there may be no alternative upland site for sewage treatment. If not, then sewage treatment structures must be elevated two feet above base flood elevation.)

The Task Force also feels that transportation improvements which are new or major reconstructions should comply with all NFIP standards for construction in flood plains. Certain highways should be designated as critical (those which must remain open to ensure the Governor can move personnel and equipment across the Missouri River to assist in disasters), and therefore built to 500 year flood standards.

Besides enacting state-wide standards for new structures, the Task Force also felt the State should review policies for existing structure in the flood plain. For those that cannot be reasonably moved, the State should enact building standards that require flood-proofing consistent with NFIP standards. Critical structures should be required to either elevate or flood-proof to two feet above the base flood elevation, or vacate basements and floors to a level two feet above base flood elevation.

The Task Force also felt that the State should do its part to improve the National Flood Insurance Program by encouraging maximum participation of flood plain communities in the Program. This will allow all those individuals who wish to purchase flood insurance, an opportunity to do so. Those communities who actively participate in the NFIP, will be given priority in funding assistance in future flood incidents. The Task Force also recommends that legislation be passed that requires appraisers, lenders, insurance agents, and realtors to determine and notify all persons involved with land and other real estate transactions, the status of the property relative to the 100 year flood plain. This will ensure that the public is informed when purchasing a structure located in a flood plain. Those individuals that wish to purchase property in a flood plain will be able to do so, but the Task Force feels that lenders must require those who take a loan on flood plain property must maintain flood insurance as a condition of the loan.

RECOMMENDATION 5: REGULATE HAZARDOUS MATERIAL IN FLOOD PLAINS

During the floods of '93, there were several instances when public safety was seriously threatened due to hazardous materials. Fortunately quick action by law enforcement officials prevented what could have been a major disaster. In order to minimize the risk of hazardous materials during future floods, the Task Force recommends that the State should adopt legislation that: (1) prohibits commercial propane and gas storage facilities from location in the flood plain; (2) requires all noncommercial propane and gas tanks in the flood plain be securely anchored to the ground, with the name and address of the owner permanently affixed; (3) require construction and location of natural gas line in the flood plain be performed in such a way as to prevent rupture due to flooding; (4) require natural gas pipeline companies to provide information on easily accessible emergency shut-off valves to state and local emergency response agencies. (Amend RSMo 319.500 to include natural gas pipelines along with existing safety requirements for the transport of hazardous liquids in pipelines. The current state statute calls for an emergency response plan describing the operator's procedures, including accurate mapping of the location of pipeline facilities and communication and alert procedures for immediate notification of state and local officials at the time of any release.); (5) prohibit new commercial manufacture or storage of pesticides in the flood plain, while requiring that current manufacturing and storage structures be flood-proofed or elevated to two feet above base flood elevation. (River terminal storage structures must be elevated or flood-proofed.); (6) require that temporary individual pesticide storage facilities located in a flood-prone area must be evacuated when a flood event is forecast; (7) require new or existing storage for individual use of pesticides be elevated or flood-proofed to two feet above base flood elevation; (8) prohibit future placement of hazardous substances from location in flood prone areas; (9) require current

storage facilities for hazardous substances be elevated or flood-proofed to a level two feet above the base flood elevation.

RECOMMENDATION 6: OVERSEE LEVEES

The Task Force found that the current levee situation in Missouri invites levee wars--a situation where each community, each farmer is encouraged to continue building his levee higher and stronger in order to protect his interest and ensure river water flows elsewhere. But by everyone adopting a strategy to ensure his own safety, the aggregate result appears to actually increase the flood danger by increasing the height and velocity of the river flow during floods.

Missouri, with two major rivers impacting our state, has an abundance of levees built to protect agricultural land, homes, communities, businesses, wildlife and recreational areas. While recommendations of the Task Force to actively manage flood plain usage may result in decreased need for a number of levees, Missouri will continue to need levees in many areas to protect infrastructure, homes, and significant economic bases, including agriculture and business.

But, the Task Force feels the time has come to consider the whole levee system in Missouri, and recommends that as a long term strategy in order to prevent "levee wars," the State adopt a permit program for construction or modification of levees; and, inventory and describe all existing levees for the purpose of developing policy guidelines and design criteria. Any issued permit by the State would be deemed to meet the requirements of reasonable use. The State should also review the current levee system for the affect it had on '93 flooding, and determine the need for relocation of levees, set backs, and construction standards. As a short term strategy, the Task Force recommends that farming levees be rebuilt to no higher than pre-flood height, and that State agencies work with farmers to allow repair of levees. Levees not meeting Corps of Engineers standards, should strive to do so. In all, Missouri has over 1,450 levees, with only 110 participating in the Corps of Engineers program. Levees lacking public sponsors, and not participating in the Corps program find themselves without sufficient financial backing during a flood disaster to repair the levee. Therefore, the Task Force recommends legislation be enacted to make it easier for levee districts to form and find public sponsorship and participate in the Corps of Engineers program.

RECOMMENDATION 7: ENCOURAGE FEDERAL REFORM OF THE NFIP

Whether the problems are structural or political, the National Flood Insurance Program is not working as conceived. In order for the Program to assure policy holders protection, and remain solvent and not continue to draw on the federal treasury, the Program must dramatically increase participation by communities and individuals. Voluntary participation in the program remains a problem. Past bailout of non-participants in the Program has convinced many there is no need to join. Potential insurees ask "Why pay insurance money when the federal government will bail you out after a disaster?" Also, many of those who do join the Program do so that they may continue to occupy areas that should be vacated. But since individuals can collect multiple claims after disasters, there is no incentive to move, and they stay. The NFIP has thus often been accused of actually promoting growth in flood hazard areas, and in some sense increasing disasters assistance claims. For this reason, the focus of the NFIP should shift from insurance and emergency disaster assistance to prevention of disasters through mitigation. This is a long term strategy. But one that will save taxpayer money.

The Task Force recommends that the State encourage the Federal Government to: (1) establish substantial penalties for lenders that fail to notify prospective mortgagees of flood hazards, or fail to require flood insurance coverage through the life of the loan; (2) require escrow for flood insurance, and authorize the regulated lending institution or federal agency to purchase the insurance on behalf of the borrower.

In addition, the Task Force also recommends that the federal government recalculate the base flood elevation and make that information available to states and local governments, so they can adequately measure the needed size of levees and the potential impact of building levees in the state.

In summation, the Task Force feels that the State needs to pursue a combination of structural, nonstructural, and acquisition/relocation strategies for flood control, while taking on a greater regulatory role in flood plain management. The Task Force proposes a number of recommendations to increase Missouri state government, federal and local government management of flood plain usage. It is felt that without a more active involvement by the State that flood devastation will repeat in Missouri. In order to mitigate future damage, the Task Force feels the State can make a significant contribution by adopting legislation and providing resources to actively managing flood plain usage, overseeing levees, encouraging willing sellers to move out of the flood plain, providing farmers with alternatives to farming flood plain land, regulating hazardous material in the flood plain, and leading by example.

EXECUTIVE ORDER
93-40

WHEREAS, I have declared a flood emergency pursuant to my authority under Chapter 44, RSMo; and

WHEREAS, it is essential that state policy be directed to minimize the risk of future devastation; and

WHEREAS, proper management of areas in the flood plain, including development, rebuilding, and other post-flood projects, require proper attention to sound long-range policy;

NOW, THEREFORE, I, Mel Carnahan, Governor of the State of Missouri, by virtue of the authority vested in me by the Constitution and laws of the State of Missouri, do hereby establish the Task Force on Flood Plain Management. The task force shall be composed of two members of the House of Representatives, who shall be appointed by the Speaker of the House; two members of the Missouri Senate, who shall be appointed by the President Pro Tempore of the Senate; and the directors (or their designees) of the Departments of Agriculture, Natural Resources, Conservation, Highways and Transportation, Economic Development, Public Safety, the Office of Administration, and four persons designated by the Governor; the executive director of the Missouri Housing and Development Commission or his designee; the state Treasurer or his designee; one representative of the Missouri Municipal League; and one representative of the Missouri Association of Counties.

The task force members shall be designated within ten days of this order.

The Governor shall designate one of the members of the task force to serve as chair.

The task force shall review and make recommendations to the Governor, the General Assembly, and agencies of state government, as appropriate, on the following matters:

1. The building, rebuilding or relocation of levees.
2. State highway and road projects in flood plains.
3. Expenditures of public funds for projects in flood plains which require state action or approval.

The task force will review plans by the United States Army Corps of Engineers for the construction or reconstruction of levees in order to develop the state's position on such projects.

The task force will mediate any issues that arise between and among different agencies of state government and recommend resolution of such issues to the Governor. The task force will also make recommendations on the state's role in implementing federal flood insurance programs.

The task force will make recommendations to the Governor regarding proposed legislation and long-term policy regarding development of housing and other private and public structures in flood plain areas.

The chair of the task force will advise representatives of the United States Army Corps of Engineers and the United States Department of Agriculture, Soil and Conservation Service, and the Federal Emergency Management Agency of its meetings and deliberations and invite the federal agencies to participate.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Missouri, in the City of Jefferson, on this 22nd day of October, 1993.



Neil Cammack
GOVERNOR

ATTEST:

Judith K. Josselyn
SECRETARY OF STATE

APPENDIX B - GOVERNOR'S TASK FORCE ON FLOOD PLAIN MANAGEMENT
MEMBERS

Jerry B. Uhlmann, Chairman
State Emergency Management Agency

Joe Driskill
Department of Economic Development

Senator Steve Ehlmann
23rd District

Jill Friedman
Governor's Office

Estil V. Fretwell
Missouri Farm Bureau

Louise Gardner
Missouri Municipal League

Richard Grose
Missouri Housing Development Comm.

Deirdre K. Hirner
Conservation Federation of Missouri

Bob Holden
State Treasurer

Susan Jenkins
Office of Administration

Senator Sidney Johnson
34th District

Brad Ketcher
Governor's Office

Joe Mickes
MO Highway & Transportation Dept.

Bill Moore
Governor's Special Assistant

Rep. Francis Overschmidt
110th District

Jerry J. Presley
Department of Conservation

John Saunders
Department of Agriculture

David Shorr
Dept. of Natural Resources

Donnie Stockman
Missouri Association of Counties

Representative Gary Wiggins
8th District

APPENDIX C - GOVERNOR'S TASK FORCE ON FLOOD PLAIN MANAGEMENT COMMITTEES

LEVEES

DEPT OF AGRICULTURE
DEPT OF CONSERVATION
DEPT OF HIGHWAY AND TRANS
DEPT OF NATURAL RESOURCES
SEMA

RELOCATION

DEPT OF ECON DEVELOPMENT
MHDC
STATE TREASURER
MISSOURI MUNICIPAL LEAGUE
SEMA

FLOOD PLAIN USAGE

DEPT OF NATURAL RESOURCES
DEPT OF AGRICULTURE
DEPT OF CONSERVATION
DEPT OF HIGHWAY AND TRANS
MISSOURI ASSOC OF COUNTIES

LEGISLATIVE REVIEW AND PROPOSALS

GOVERNOR'S OFFICE
HOUSE OF REPRESENTATIVES
SENATE
OFFICE OF ADMINISTRATION

All Task Force Members were encouraged to attend each committee meeting.

APPENDIX D

DEFINITIONS

Base Flood - the flood which has a one percent chance of being equalled or exceeded in any given year (also known as a 100-year flood). This term is used in the National Flood Insurance Program (NFIP) to indicate the minimum level of flooding to be used by a community in its flood plain management regulations.

Facility - any man-made or man-placed item other than a structure.

FEMA - the Federal Emergency Management Agency.

Five Hundred Year Flood Plain - that area, including the base flood plain, which is subject to inundation from a flood having a 0.2 percent chance of being equalled or exceeded in any given year.

Flood - a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland and/or tidal waters, and/or the unusual and rapid accumulation or runoff of surface waters from any source.

Flood Plain - the lowland and relatively flat areas adjoining inland and coastal waters including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Flood-proofing - the modification of individual structures and facilities, their sites, and their contents to protect against structural failure, to keep water out, or to reduce effects of water entry.

Floodway - that portion of the flood plain which is effective in carrying flow, within which this carrying capacity must be preserved and where the flood hazard is generally highest, i.e., where water depths and velocities are the greatest. It is that area which provides for the discharge of the base flood so the cumulative increase in water surface elevation is no more than one foot.

Hazardous Substances - those substances which possess one or more of the following characteristics: ignitable, reactive, corrosive, or toxic. Those substances as specifically defined in CSR 24-2.010-17.

Levee - a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

Mitigation - all steps necessary to minimize the potentially adverse effects of the proposed action, and to restore and preserve the natural and beneficial flood plain values and to preserve and enhance natural values of wetlands.

New Construction - the construction of a new structure (including the placement of a mobile home) or facility or the replacement of a structure or facility which has been totally destroyed.

Open Space Use - includes parks for outdoor recreational activities, nature reserves, cultivation, grazing, camping (except where adequate warning time is not available for evacuation), temporary storage in the open of wheeled vehicles which are easily moveable (except mobile homes), unimproved parking lots, buffer zones, or open space areas that are part of Planned Unit Developments (PUD's).

Pesticides - any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or any substance or defoliant, or desiccant. (Specific substances shall be in accord with the Federal Insecticide, Fungicide, and Rodenticide Act).

Structures - walled or roofed buildings, including mobile homes and gas or liquid storage tanks.

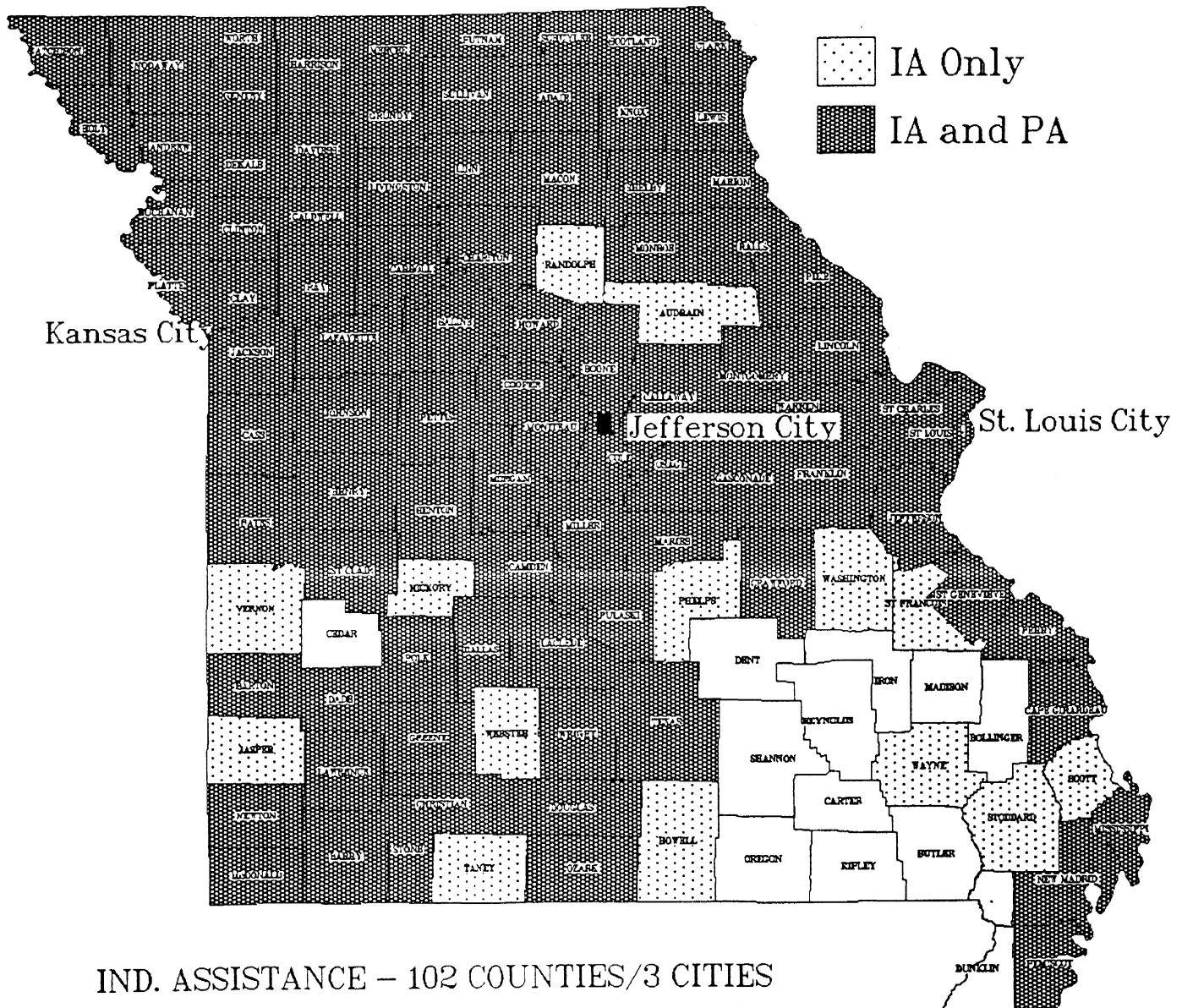
APPENDIX E - COUNTIES DECLARED DISASTER AREAS

INCIDENT PERIOD: 4/15/93 TO 5/29/93



INDIVIDUAL ASSISTANCE - 8 COUNTIES

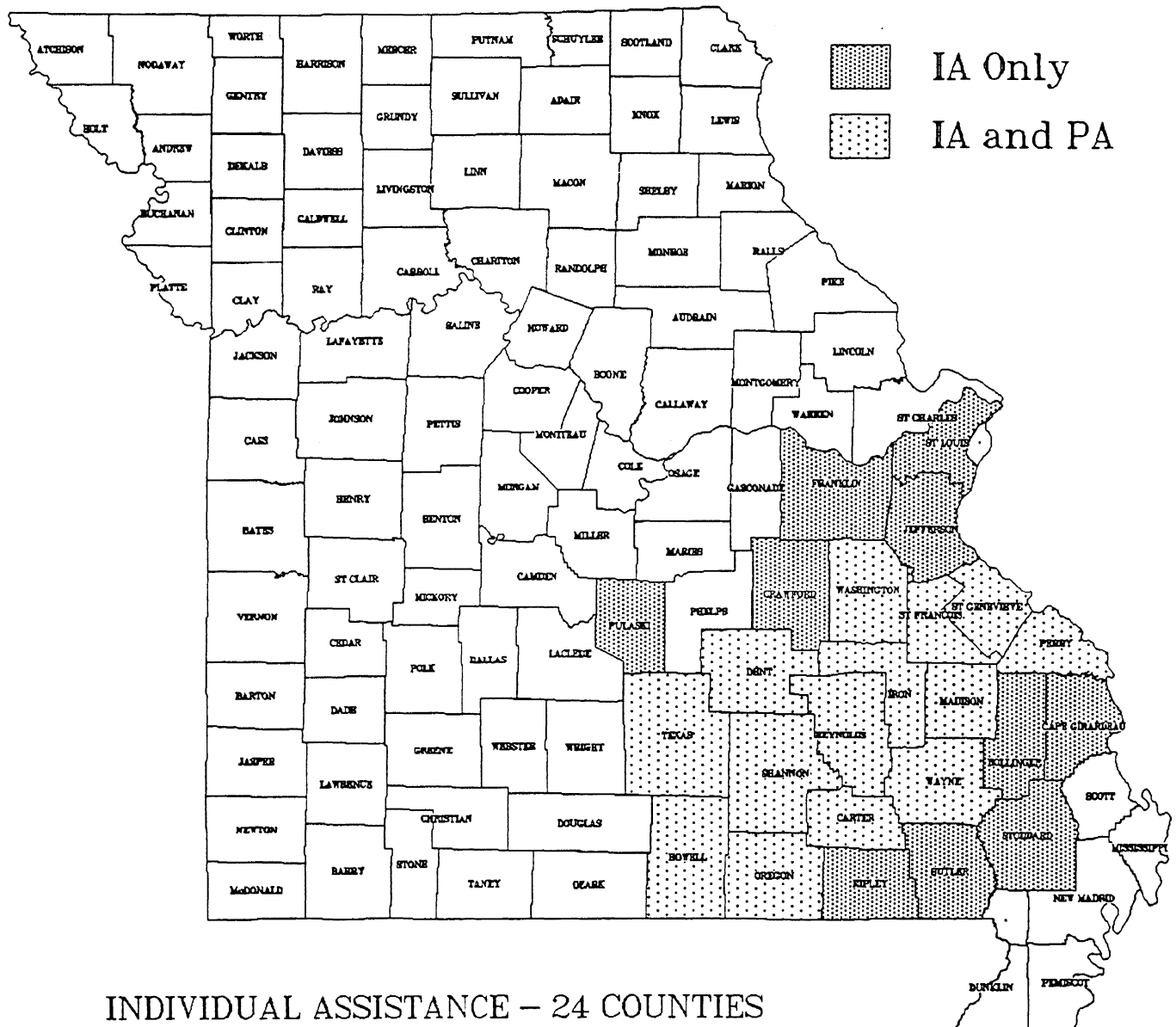
INCIDENT PERIOD: 6/10/93 TO 10/25/93



IND. ASSISTANCE – 102 COUNTIES/3 CITIES

PUBLIC ASSISTANCE – 88 COUNTIES/3 CITIES

INCIDENT PERIOD: 11/13/93 TO 11/19/93



INDIVIDUAL ASSISTANCE – 24 COUNTIES

PUBLIC ASSISTANCE – 14 COUNTIES